

Notes on Medical Education :

BEING

REPLIES TO THE INQUIRIES ADDRESSED TO TEACHERS

BY THE

GENERAL MEDICAL COUNCIL.

BY

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the parts of the brain and cord, the arrangement of certain nerves, the structure of the viscera, the functions of which he is discussing, the valves of the heart in giving its sounds, and so on. Formerly time was wasted in both of these classes by repetition, the teacher of Anatomy endeavouring to go into Physiology also, while the teacher of Physiology endeavoured again to go formally through General Anatomy, and in some schools even now, I understand, the teacher of Physiology gives also the Anatomy of the viscera—of those parts which concern the physician—while the teacher of Anatomy takes the parts which most concern the surgeon. It may be a convenient arrangement for the teacher of Anatomy who is occupied in surgical practice to be thus relieved of those parts of the course which most require the use of the microscope, and make demands on his time; that may be a matter of necessity in some, especially in the smaller schools, but it does not tend in the direction of thoroughness of anatomical teaching. In the Scotch Universities there is the course of Anatomy, and the course of Physiology, the latter known frequently by the ancient title of “Institutes of Medicine,”* and supposed to include more or less Pathology. The Professors of Anatomy, on the other hand, are appointed for Anatomy, and, devoting themselves to Anatomy, teach it in all its branches. I may mention, for instance, that I hold my commission from the Crown as “Professor of Anatomy.” The distinction in our Universities, therefore, is not a matter of arrangement. I have observed a gradual approximation to this system on the part of other schools, and my opinion is that it is the best. Without General Anatomy and the use of the microscope, anatomical instruction would not only be deprived of much of its value and interest, but would hardly be worthy of the name.

Physiology proper is a very extensive subject, every day becoming of greater importance to practical medicine, and the teacher of it, by confining himself to his subject, is able to find time for experimental illustration, without which, now-a-days, a course of Physiology cannot be reckoned complete.

* See my “Historical Sketch of the Edinburgh Anatomical School,” p. 84, et seq.

2. "The period in a four years' course when they can be most profitably studied, and the length of time which should be devoted to them."

The period when anatomical study is laid aside is practically regulated by the period of the pass examination in Anatomy. When we take into account not only the importance of Anatomy, from its nature and extent, but that the knowledge of it acquired by the student has generally to last him for life, as it is almost the only branch which the practitioner is unable to improve himself in, practically, after he has left the medical school, it is not too much to say that anatomical study should not be allowed to be thrown aside before the end of the third year. I am far from saying that further dissection may not be engaged in with advantage during the fourth year also, if the student can find time for it, for I would hesitate to appear to assign any arbitrary limit to the attention which the student should give to the dissection of the human body.*

The study of Physiology should not begin before the student has some acquaintance with Anatomy and Chemistry. The pass examination in Physiology should be at the same time as the pass examination in Anatomy.

3. "The manner in which they can best be taught—by lectures, practical instruction, or otherwise."

In a well organised school of Anatomy, the teaching should be, in part to the assembled class, in part to small groups, and in part to individuals.

All lectures on Anatomy should be well illustrated by fresh dissections, by specimens and dissections from a good

* I do not mean that the Lectures should be attended during three years as was formerly the custom ; ordinarily it should suffice if the Course of Lectures on Anatomy is diligently attended during the first and second winter sessions ; but attention to anatomy by dissection and practical study should not cease before the end of the third year. The dissections should be made with care, and studied. Careless dissection is of little value. Even a neatly-made dissection, unless it is carefully studied, goes for little beyond training the hand. An important part of the work in the practical rooms consists not merely in the practice of dissection, but in studying the dissections. It is a severe tax on the time and work of the teacher, but it should be seen to that all the dissections are carefully made and carefully studied.

anatomical museum, by good diagrams; and sketches on the black board are often useful, if the lecturer can sketch. Besides by the exhibition of the parts and their description, the lecture is rendered doubly interesting and useful when the parts are also viewed, on the one hand, in their scientific aspect, and on the other hand, in their practical aspect in relation to Medicine and Surgery (that is, when both scientific and surgical Anatomy are combined) so as to render attractive simple and impressive, what, when otherwise treated, have been, and with some truth might be, called the dry details of Anatomy.

To such a course, as guiding and stimulating the student, as well as giving instruction, it would not be easy to attach too high a value. Instruction of this kind can be delivered only in the theatre, and quite suitably to the assembled class. But if the anatomical lecture is to be only a demonstration, it would, no doubt, be better to have the class subdivided into groups (the tutorial system, in the sense of being to small classes), as the purpose of demonstration fails when the condition of seeing all the parts distinctly is unattainable. The most valuable form of demonstration, no doubt, is that to each individual over his dissection, but in addition to this there should be more formal demonstration to groups appropriately classified and sufficiently small to enable each to see the parts clearly. The practical objection to the tutorial (small group) system of demonstration is the demand on the teacher's time which it implies, and this will be most felt in large schools or where the teacher has other engagements.

A complete course of Anatomy cannot be given in the 100 lectures, or meetings, usually allotted. Fifty or sixty lectures additional would be needed. If we cannot go on the plan of making the best of the 100 lectures, by selecting what is most suitable for the lecture-room, and trusting to dissection and tutorial instruction for the rest, these additional lectures might be given as a supplementary course, if time can be found. But another formal lecture, as a daily system, is a thing to be avoided if possible; a supplementary tutorial system being preferable, reserving for it those parts to which this method is

better suited. This can be done at hours when appropriately-arranged groups of the class can attend. The teacher who is present at his anatomical rooms during the day need have no difficulty in arranging these details.

The pupils should also be examined systematically in connection with the course of lectures, and each demonstratively, on the "part" which he is dissecting, and a record should be kept of the result according to a scale understood in the school.

But there need not be absolute uniformity in detail, even were it attainable, amid the various natural and accidental peculiarities of schools, and the various qualifications of teachers. My ideal, however, of an anatomical school system would be, a good guiding and stimulating course of lectures, supplemented by tutorial teaching, accompanied by and fitting into a practical course, in which there would be careful dissection and practical demonstration to individuals and to small groups; the whole accompanied by regular examination, so as to ascertain and insure progress. A matter of much greater importance than laying down a detailed method of teaching is to promote a system in the schools which will produce and retain good teachers. Such teaching as I have indicated can only be where, besides the demonstrator or demonstrators, there is an anatomist making the work of the school and the science of Anatomy his sole or chief occupation; who, besides giving the lectures, superintends the work of the practical rooms, and sees that the two shall work into each other so as to form, between them, a complete system. There can be no thorough teaching when the lecturer merely comes in for an hour or two from his practice, and is desirous of leaving the lectureship on Anatomy for that on Medicine or Surgery as soon as he can. It is of great value to the surgeon and physician to have had such training, but it is through the demonstratorship he should be so trained; the lectureship or professorship of Anatomy should be made worth remaining in, worth giving up Surgery or Medicine for, if Anatomy is to hold the place in a school which its importance demands. It is partly to these conditions having been to some extent attained in them that the Scotch Universities owe their position as anatomical schools.

Some of the schools appear to me to err in not having anatomical instruction also in the Summer Session. Though dissection is not so pleasant during the latter part of it, the student may, notwithstanding, thus considerably extend his acquaintance with Practical Anatomy. Practical demonstrations may also be given, and occasional lectures on certain parts of Anatomy, as Comparative Anatomy, and more especially on General Anatomy. It is a very suitable time to train the student to work with the microscope. There should be a room fitted up for microscopical study, and provided with microscopes, in connection with every dissecting-room, in which the pupils could work at any hour, as in the dissecting-room; and the teacher of Anatomy might give lectures and demonstrations on Histology (General Anatomy) once or twice a week, to guide the student systematically through the course. As the student has not much leisure for working with the microscope during the Winter Session, this comes very appropriately in the Summer. I have found this method to be attended with the most satisfactory results, not merely a few, but all the students in my class being, in consequence, as familiar with minute Anatomy, and with the use of the microscope, as they are with the Anatomy of the dissecting-room, and with the use of the scalpel and forceps.

In regard to the teaching of Physiology, it should be kept in mind that the student is not so much dependent on a teacher for it as for Anatomy, that a knowledge of it may be in a large measure obtained by the thoughtful study of a good text-book. Merely got-up lectures on a profound subject like Physiology can be of little or no use. But a good course of Physiology, by a teacher who devotes his time largely to the science, and who can draw his illustrations from Anatomy, human and comparative, and from Pathology, ought to be of great value. The time saved by avoiding the repetition of anatomical description, with which the student is already familiar, should be given to illustrating the phenomena of life by experiment. To see a well-conducted experiment is of greater value than to listen to an hour's talking. There should also be regular and careful examination in the Physiology class, so as to see that the student understands phenomena, and reasons well from them. Indeed,

the Physiology course admits of being, to a large extent, conducted by the tutorial method—the question and answer method, with explanations, the teacher also showing experiments.

PART II.—*Further Observations in connection with Medical Education.*

I have long spoken and written against too much lecturing in Medical Education. But some have carried this too far, not discriminating between use and abuse. Besides setting a limit to the number, the question is not so much one between lectures or no lectures, as between good lectures and bad.

There may be three kinds of lecturing—1. Elementary description, like a spoken text-book ; 2. Criticism and discussion ; 3. Exhibition and explanation of objects or experiments.

It should be borne in mind that now there are good text-books in all the departments of medical education, and that these are in the students' hands ; that the sciences are too extensive to be treated exhaustively, and that especially mere details are unsuited for the lecture-room. Also that the most vicious form of lecturing is that of addressing the memory, usually termed cramming or grinding. A good lecture will partake of the three kinds above indicated, in proportions varying with the nature of the subject ; it should be devoted to the illustration and enforcement of the great facts and principles of the science, to explaining difficulties, to the discussion of different views, to pointing out where further inquiry is needed, and the whole conducted so as to train the student's observing and reflecting faculties, instead of overloading his memory. Lectures will always be more valuable in the demonstrative sciences, as Anatomy and Chemistry. Were the lecture to consist of demonstrations only, it would be more useful if given in a more practical form to small groups, but the value of such lectures depends largely on the due blending of the exhibition of objects and phenomena, with the enunciation of ideas and principles, and their application to the art.

Lectures in departments which admit of little objective illustration must be valueless if they are mere compilations.

There is the stimulus of the living voice, which no doubt may be great, but that again depends on whose voice it is. More might probably be done in these departments by a system of examination with interspersed explanations and remarks (the tutorial method), the class meeting on alternate days, the pupils having been directed what to study meanwhile. In this way the student might be guided through the science, and have his difficulties removed better than by formal lectures. The term *tutorial* has been variously used. In our medical schools it has been sometimes applied to the exhibition of objects to small numbers (tutorial demonstration), or to otherwise teaching small numbers, sometimes to examination—the question and answer method with explanations (the tutorial method). By the tutorial method when fully carried out, is to be understood, not examination on what has been previously treated in lectures but examination with explanations, instead of lectures. The terms “professorial” and “tutorial” are sometimes used to contrast the lecturing and the examinational methods, associating the one with the idea of a large class, the other with the idea of a small number. But the teacher may conduct his assembled class by the tutorial method, while formal lectures may be, and often are, delivered to small classes. In point of fact the classes in Arts in the Scotch Universities are taught by the professors more by the tutorial than by the lecturing method, showing the professorial system working by the tutorial method. Instead of employing the word “lecture,” in the regulations for the medical curriculum, it might be better to adopt the word “meeting,” as suitable to any form of teaching.

The system of reading lectures in medical education is objectionable. Besides the want of directness and life in the delivery, the inevitable tendency in the case of rapidly advancing sciences, is for the manuscript to get behind the age. It is to be feared that these venerable manuscripts are still too common in the medical schools.

But even the best lectures become an evil when carried to the extent of interfering with practical study. This is the tendency in a crowded school, where it is scarcely possible sufficiently to overtake the practical teaching of individuals. Again,

when the school is small and unendowed, the teacher generally cannot afford to give much time to teaching or to preparation for it, and as lecturing of a kind is the easiest and shortest method, a course of lectures written once for all is apt to be repeated from year to year. There can be no doubt of the paramount importance of practical study and instruction, by which I mean the pupils being afforded opportunities and at the same time having instruction given by a teacher to individuals or to small groups. Every teacher should have not merely his lecture room and museum, but also his practical room in which the members of the class can work, and where he can work with them, training them to observe and act for themselves. The first aim of a school, and of each teacher, should be to set aside a sufficient time for practical study, including hospital work. The number of lectures may be reduced with advantage in most of the departments, and all the lectures, or meetings, should be as practical as possible. In Anatomy and Chemistry a systematic class should meet daily, as they depend so much on the teacher, the objects and experiments to be shown and explained being so numerous. For Physiology, Materia Medica (if in the Winter Session), and Surgery, three meetings a week might suffice. If the Practice of Medicine class meets daily, from the great extent of the subject, the tutorial method might be largely employed. If the systematic teachers of Surgery and Medicine are, as they always should be, also hospital teachers, they will more readily see their way to not giving too many systematic lectures. In the Scotch Universities the courses of Midwifery and Materia Medica are each courses of a hundred lectures. They should be reduced to fifty, as in other schools. The subject of Midwifery may be at least as fully treated in fifty lectures as that of Practice of Medicine in a hundred. The teachers of Materia Medica and Medical Jurisprudence should have commodious laboratories fitted up, where the pupils can work, and in which the meetings could be held rather than in the lecture room whenever there is anything practical to be taught. For practical work a class may be subdivided when necessary, the teacher attending daily, and half of the class on alternate days. There should be extensive museums connected

with every school, and arrangements made so that the specimens can be studied on the shelves, not merely seen hurriedly on the lecture-table. The dissecting room should be open throughout the day, with superintendence and frequent demonstration. The chemical laboratory the same. The hospital should have not less than two hours set apart for it, with daily clinical instruction at the bedside, and arrangement made for practical instruction in Pathological Anatomy. In the Summer Session, the same practical instruction, Anatomical, Chemical, Clinical and Pathological should go on uninterruptedly; and the courses of Botany, Midwifery, Medical Jurisprudence, and perhaps Materia Medica, should be delivered then, taking care not to crowd too much into the comparatively short space of the Summer Session.

I may mention further the opinions which I have been led to form regarding instruction in several branches. The teaching of *Practical Chemistry* in the medical schools seems to me not to have made much progress, as to method, for many years. The custom still, I understand, continues of teaching a class of some twenty-five pupils at a time, for an hour a day during three months, and this not till a systematic course of lectures has been completed. Instead of this, to which the term "practical" is scarcely applicable, the systematic and practical should go on together, as in Anatomy; the laboratory being open all day as the dissecting room is, the pupils working under the direction of the demonstrator, as in the dissecting room. The first-year students should be working in the laboratory almost as much as in the dissecting room. It is the year they have most time for it, and they would thus not only understand Chemistry better, but would get from the beginning the habit of conducting chemical operations.

Pathological Anatomy,—General and special, should be more prominently and practically taught than it is in British schools. It is a question how far the more thorough teaching of Pathology, together with clinical lectures, might supersede the necessity for systematic courses of Medicine and Surgery. Systematic lectures on the principles of Medicine and Surgery, how-

ever, are useful if good and not too numerous, while Clinical lectures are too apt to be merely systematic lectures without system.

Clinical Instruction.—No part of medical education stands more in need of re-consideration than the present hospital system. How best to utilise our hospitals for medical education. The present system is on the whole very loose. There may be no further evidence of attendance than signing a book once a quarter or once a month, the pupils crowd here or there without order or system, and valuable opportunities are not made use of. The hours of visit should be arranged so that the visit to the surgical and medical wards is at different and successive hours, so that the pupils who wish may have the benefit of both. Instead of the system of giving what are called “Clinical” lectures to the pupils assembled in the theatre, there should be true Clinical instruction given at the bedside, and to a number so limited that each pupil can be trained. Some system should be arranged by which the pupils would be distributed among the different physicians and surgeons, whom they would follow on certain days, or during a certain part of the session, each teacher keeping his list and seeing that his allotted pupils attend. The pupils should not be merely onlookers, or merely talked to, but should be trained to use their own eyes, ears, and hands, their own powers of observation and reflection. Any remarks which are unsuitable to be made in the patient’s hearing may be made at the end of the visit in another room. Clinical medical lectures used even to be read when I was a pupil, and I understand that the practice is far from being unknown at the present time. An instance is known to me of a teacher who wrote his “Clinical” lectures a year before they were to be delivered. But even oral Clinical lectures given in the theatre to the assembled class are of little real value, as the pupils see the cases at a distance and receive no training; and they are objectionable as leading away the attention both of teacher and pupils from the true system of Clinical instruction, and as occupying time which should be spent in the wards. It is a mistake to appoint one, or only a part of the hospital staff to give the Clinical instruction, to the exclusion of the

other physicians or surgeons. It leads to crowding, to the lecturing system, and curtails the field for Clinical illustration. Every physician or surgeon to an hospital is virtually a Clinical teacher, and should be formally acknowledged as such. In the regulations of the licensing bodies it would be well to substitute for the words "Clinical lectures" the words "Clinical instruction."

The practice followed at some hospitals of distinguishing between hospital pupils and Clinical pupils is injurious. Its tendency is to promote the lecture-room system at the expense of the bedside system, the temptation being to reserve the teaching for the theatre, where the "Clinical" pupils can be met apart from the mere hospital pupils. The hospital entry should include Clinical instruction, and all hospital pupils should be at the same time and equally Clinical pupils. Clinical teachers should be remunerated, not by drawing an injurious distinction between hospital and Clinical pupils, but by receiving the hospital fees, which may be regulated accordingly. I am convinced that the removal of this distinction between hospital and Clinical pupils is a point of great importance, lying at the root of progress in a true Clinical system. My opinions regarding Clinical instruction were formed during my long connection with the Edinburgh Surgical Hospital, and have been strengthened by what I have observed since.

I am desirous of alluding to another part of medical education, the neglect of which in most of our schools has a narrowing effect, and is liable to be attended with serious results. I allude to the *History of Medicine*. It is important that a young man in being educated for the medical profession should know something of the long and instructive history of medical opinion and practice, of the revolutions which they have undergone, and of the delusive systems which empirics have set up under various names. It would enable him to form a more just estimate of the aims and value of modern Medicine, to discriminate better between what may be due to nature and what to art, to avoid being led away by delusions, new or old, and more readily afterwards to abandon whatever the progress of science had proved to be erroneous. I would not propose to burden the student with attendance on a course of lectures on

the History of Medicine, but the attention of teachers might be more directed to the subject, and to the importance of recommending their pupils to study the history of their profession.

I understand that, at present, the inquiries addressed to me are limited to education, and do not include the question of the best method of conducting the pass examinations. The method of conducting these has an important bearing on education, and on the value attached to different methods, and, I believe, admits of being in several respects considerably improved. This, I presume, may form the subject of subsequent inquiry.

